



## 1.b. Background Exercise IOWave25 and Scenarios

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*Acknowledgements: Ms. Nora, Secretariat of ICG/IOTWMS*

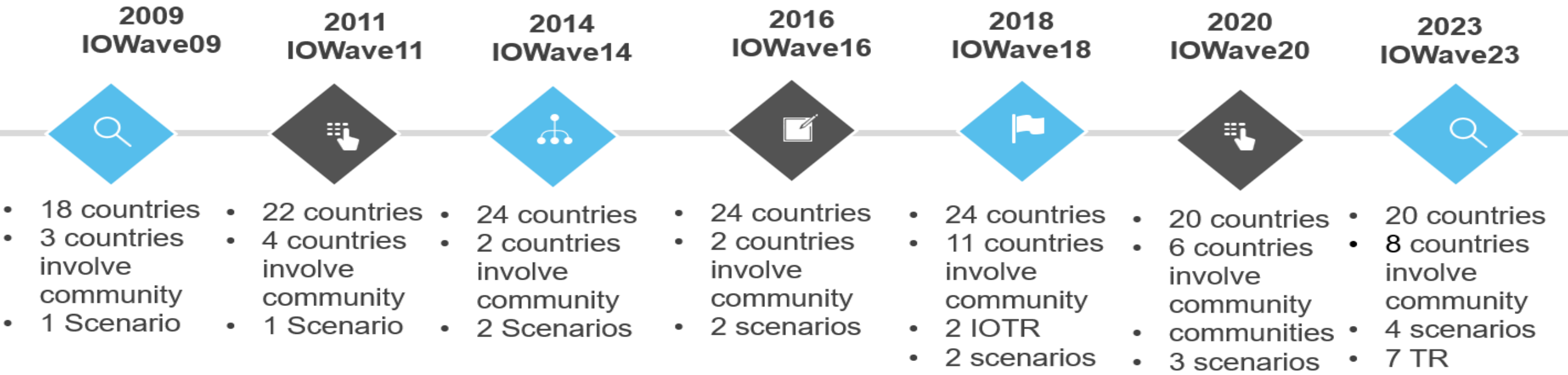
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- Dr Weniza, Indonesia - WG1 Chair
- Mr Padmanabham Jijavarapu, India - WG2 Chair / TSP India Representative
- Ms Suci Dewi Anugrah, Indonesia - WG3 Chair
- Mr Ardito Kodijat - IOTIC

- Task Team established during **ICG/IOTWMS-XIV** (Nov 2024, Banten, Indonesia)
- Scheduled for **September – November 2025**
- Member States encouraged to ensure **broad participation**, including at community level

# Previous Indian Ocean-Wide Tsunami Exercises (IOWave)

Conducted by ICG/IOTWMS to test tsunami notification and response systems:

- 1. **IOWave09** (Oct 2009)
- 2. **IOWave11** (Oct 2011)
- 3. **IOWave14** (Sep 2014)
- 4. **IOWave16** (Sep 2016): Over 60,000 people participated in evacuation drills
- 5. **IOWave18** (Sep 2018): Participation exceeded 119,000
- 6. **IOWave20** (Oct 2020): Testing communication protocols during the pandemic
- 7. **IOWave23** (Oct 2023): ~45,000 people participated, including all genders, children, elderly, and persons with disabilities



## Purpose:

- To evaluate and improve **the effectiveness of the IOTWMS**, through its operational Tsunami Service Providers (TSPs), National Tsunami Warning Centres (NTWCs), National Disaster Management Organisations (NDMOs) and Local Disaster Management Organisations (LDMOs), and other relevant authorities in responding to a potentially destructive tsunami.
- To test **operational lines of communications, review tsunami warning and emergency response Standard Operating Procedures (SOPs) and promote emergency and community preparedness** in India Ocean countries.

There are nine (9) objectives of Exercise IOWave25. Each objective is designed to validate a part of the end-to-end tsunami warning and mitigation system.

Objectives 1 and 2 survey questions relate to the at-risk coastal communities.

- **Objective 1:** Validate procedures are in place to ensure tsunami warnings get to all in the community, including those with disabilities, all genders, elderly, and youth.
- **Objective 2:** Validate the level of community awareness, preparedness, and response.

Objective 3 and 4 survey questions relate to standard operating procedures at all levels in the national tsunami warning chain.

- **Objective 3:** Validate the Standard Operating Procedures associated with tsunami warning chains within countries for generating and disseminating tsunami warnings to their relevant emergency response agencies, other authorities, media, and the public.
- **Objective 4:** Validate the Standard Operating Procedures associated with tsunami warning chains within countries for the issuing of public safety messages, ordering evacuations and where possible issuing all-clear messages.

Objectives 5 to 9 survey questions relate to the National Tsunami Warning Center and NAVAREA stakeholders.

- **Objective 5:** Validate dissemination by TSPs of Tsunami Bulletin Notification Messages to NTWCs via Tsunami Warning Focal Points (TWFPs) of Indian Ocean countries and the reception by NTWCs of the TSP messages. Validate the access by NTWCs to the tsunami bulletins and other products on the TSP websites, and the use of that information to produce national warnings.
- **Objective 6:** Validate dissemination by TSPs of Tsunami Bulletin Notification messages for NAVAREA stakeholders to ensure navigational safety and security.
- **Objective 7:** Validate access by NTWCs to the tsunami bulletins and other products on the TSP websites, and the use of that information to produce national warnings. Validate the reporting by NTWCs to the TSPs of their National Tsunami Warning Status.
- **Objective 8:** Validate the reporting by NTWCs to the TSPs of their National Tsunami Warning Status.
- **Objective 9:** Validate receipt and understanding by NTWCs of new TSP service for tsunamis generated by non-seismic and complex sources.

The following organisations should be involved in the Exercise:

- Tsunami Service Providers (TSPs)
- National Tsunami Warning Centres (NTWCs)
- National Disaster Management Organisations (NDMOs)
- Local Disaster Management Organisations (LDMOs)
- Media Organisations
- Local Communities

# IOWave25 Scenarios

| Scenario  | 1. Sunda Trench                 | 2. Makran Trench               | 3. Fani Maore Volcano                | 4. Sumatra Trench               |
|-----------|---------------------------------|--------------------------------|--------------------------------------|---------------------------------|
| Date      | 25 September 2025<br>(Thursday) | 15 October 2025<br>(Wednesday) | 25 October 2025<br>(Saturday)        | 05 November 2025<br>(Wednesday) |
| Time      | 01:00 UTC                       | 06:00 UTC                      | 15:00 UTC<br>(eruption at 14:00 UTC) | 03:00 UTC                       |
| Source    | Earthquake                      | Earthquake                     | Volcano                              | Earthquake                      |
| Magnitude | ~M9.0                           | ~M9.0                          | n/a                                  | ~M9.2                           |
| Depth     | 10 km                           | 10 km                          | n/a                                  | 10 km                           |
| Latitude  | 6.94S                           | 24.80N                         | 12.92S                               | 3.30N                           |
| Longitude | 104.70E                         | 62.20E                         | 45.72E                               | 95.96E                          |
| Location  | Sunda Strait, Indonesia         | Off Coast of Pakistan          | Mozambique Channel                   | Northern Sumatra, Indonesia     |





# Scenario 1

## Sunda Trench, M9.0, 25 September 2025, 01:00 UTC.

| Country              | T2 (UTC) | MAX BEACH (m) |
|----------------------|----------|---------------|
| Australia            | 01:10    | 23.9          |
| Bangladesh           | 08:12    | 1.6           |
| Comoros              | 10:00    | 0.7           |
| Djibouti             | 11:40    | 1.4           |
| France               | 06:46    | 9.9           |
| India                | 03:00    | 3.7           |
| Indonesia            | 01:00    | 31.1          |
| Iran                 | 10:58    | 0.9           |
| Kenya                | 10:36    | 1.5           |
| Madagascar           | 08:44    | 5.4           |
| Malaysia             | 08:04    | 0.6           |
| Maldives             | 04:50    | 2.7           |
| Mauritius            | 06:44    | 4.6           |
| Mozambique           | 10:24    | 2.5           |
| Myanmar              | 04:56    | 2.0           |
| Oman                 | 08:46    | 2.2           |
| Pakistan             | 11:04    | 0.9           |
| Seychelles           | 07:44    | 3.5           |
| Singapore            | -        | -             |
| Somalia              | 08:46    | 1.5           |
| South Africa         | 11:24    | 7.5           |
| Sri Lanka            | 04:00    | 2.3           |
| Tanzania             | 10:26    | 1.4           |
| Thailand             | 04:50    | 0.9           |
| Timor-Leste          | 04:31    | 0.7           |
| United Arab Emirates | 14:48    | 0.8           |
| Yemen                | 08:44    | 2.7           |

Scenario 1 starting at 01:00 UTC on Thursday 25 September 2025: Magnitude 9.0 earthquake in Sunda Strait, Indonesia. The simulated tsunami will take approximately 0 hours to travel from its source to Indonesia; 2.5 hours to travel to Australia; 3.0 hours to travel to Timor-Leste; and 4.0 hours to travel to Sri Lanka.

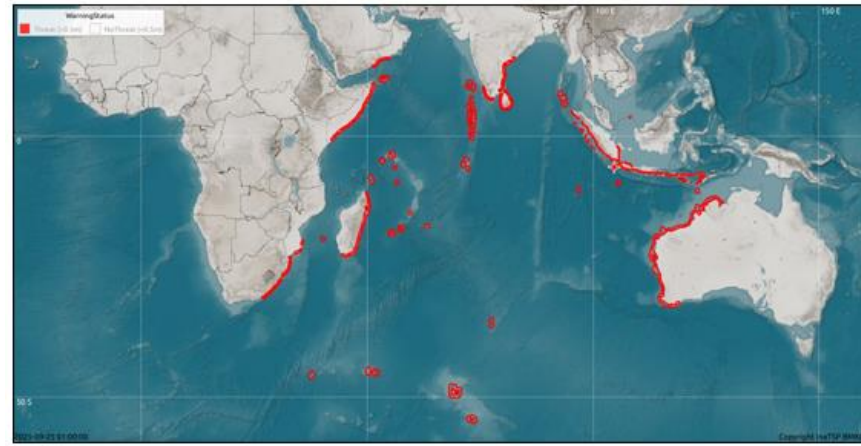


Figure 2. Threat Map example for Scenario 1, Sunda Trench, for a magnitude 9.0 earthquake.

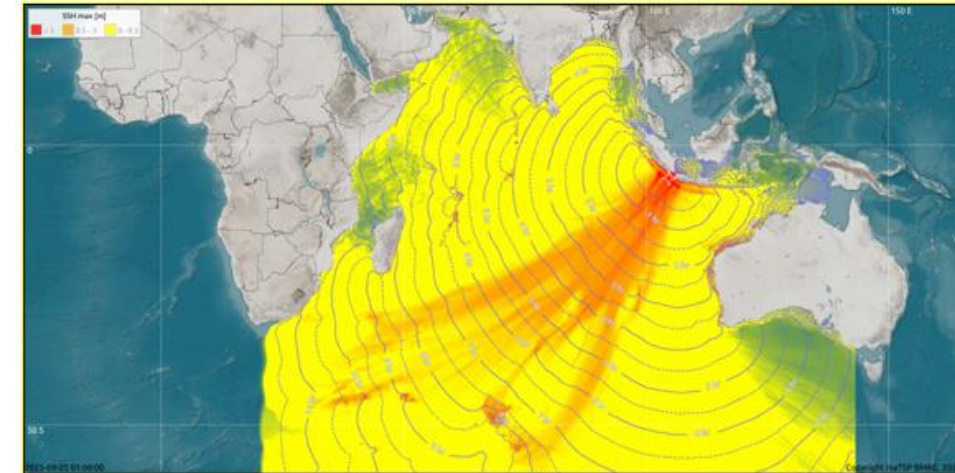


Figure 3. Maximum Wave Amplitude Map example for Scenario 1, Sunda Trench, for a magnitude 9.0.

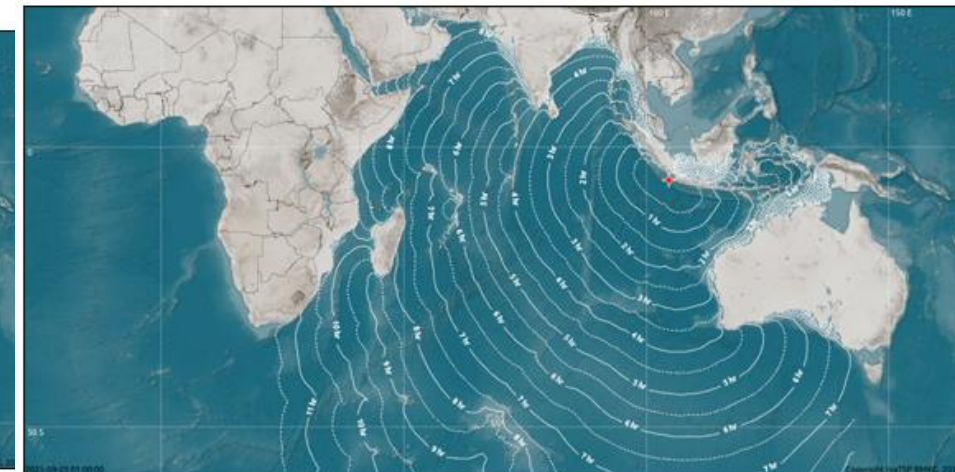


Figure 4. First detectable wave Tsunami Travel Time contour map example for Scenario 1, Sunda Trench.



# Scenario 2

## Makran Trench, M9.0, 15 October 2025 06:00 UTC

| Country              | T2 (UTC) | MAX BEACH (m) |
|----------------------|----------|---------------|
| Australia            | 19:40    | 1.1           |
| Bangladesh           | -        | -             |
| Comoros              | 12:17    | 1.0           |
| Djibouti             | 11:12    | 2.0           |
| France               | 13:30    | 1.4           |
| India                | 07:46    | 2.9           |
| Indonesia            | 13:35    | 0.7           |
| Iran                 | 06:00    | 9.3           |
| Kenya                | 12:05    | 1.5           |
| Madagascar           | 12:08    | 1.3           |
| Malaysia             | -        | -             |
| Maldives             | 09:19    | 2.6           |
| Mauritius            | 11:44    | 1.4           |
| Mozambique           | 12:32    | 1.1           |
| Myanmar              | -        | -             |
| Oman                 | 06:12    | 13.3          |
| Pakistan             | 06:00    | 18.5          |
| Seychelles           | 10:33    | 1.6           |
| Singapore            | -        | -             |
| Somalia              | 09:12    | 1.9           |
| South Africa         | -        | -             |
| Sri Lanka            | 10:41    | 1.0           |
| Tanzania             | 12:35    | 0.9           |
| Thailand             | -        | -             |
| Timor-Leste          | -        | -             |
| United Arab Emirates | 06:28    | 3.6           |
| Yemen                | 08:19    | 1.9           |

Scenario 2 starting at 06:00 UTC on Wednesday 15 October 2025: Magnitude 9.0 earthquake in the Makran trench off the coast of Pakistan. The simulated tsunami will take approximately 0 hours to travel from its source to Pakistan and Iran; 0.5 hours to travel to Oman; 1.0 hours travel to United Arab Emirates; and 2 hours to travel to India

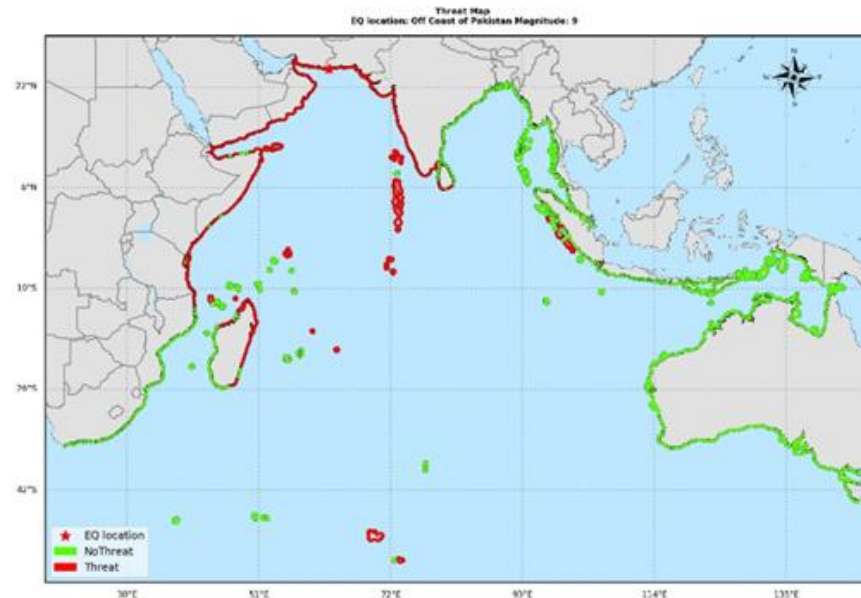


Figure 5. Threat Map example for Scenario 2, Makran Trench, for a magnitude 9.0 earthquake

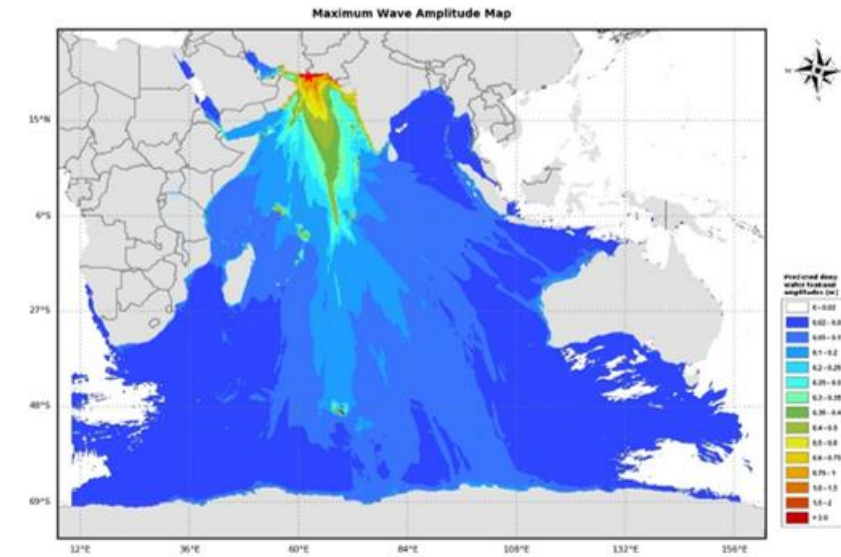


Figure 6. Maximum Wave Amplitude Map example for Scenario 2, Makran Trench, for a magnitude 9.0 earthquake.

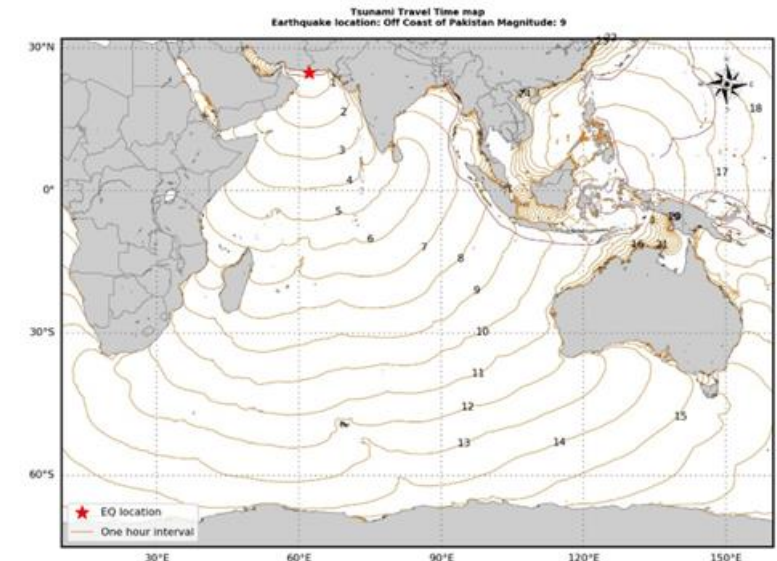


Figure 7. First detectable wave Tsunami Travel Time contour map example for Scenario 2, Makran Trench.

# Scenario 3

## Fani Maore Volcano, 25 October 2025, 15:00 UTC

| Country              | T (UTC) |
|----------------------|---------|
| Australia            | -       |
| Bangladesh           | -       |
| Comoros              | 14:15   |
| Djibouti             | -       |
| France               | 14:05   |
| India                | 19:26   |
| Indonesia            | -       |
| Iran                 | -       |
| Kenya                | 15:56   |
| Madagascar           | 14:16   |
| Malaysia             | -       |
| Maldives             | 18:57   |
| Mauritius            | 15:49   |
| Mozambique           | 14:51   |
| Myanmar              | -       |
| Oman                 | 18:48   |
| Pakistan             | -       |
| Seychelles           | 14:38   |
| Singapore            | -       |
| Somalia              | 16:00   |
| South Africa         | 17:46   |
| Sri Lanka            | -       |
| Tanzania             | 15:13   |
| Thailand             | -       |
| Timor-Leste          | -       |
| United Arab Emirates | -       |
| Yemen                | 17:55   |

Scenario 3 starting at 15:00 UTC (eruption at 14:00 UTC) on Saturday 25 October 2025: Tsunami generated by volcanic eruption at Fani Maore in the Mozambique Channel between Madagascar and the eastern coast of Africa. The simulated tsunami will take approximately 0 hours to travel to Mayotte(France), Comoros, and Madagascar; 0.5 hours to travel to Seychelles; 1.0 hours to travel to Mozambique & Tanzania; and 2.0 hours to travel to Mauritius, Kenya, and Somalia.

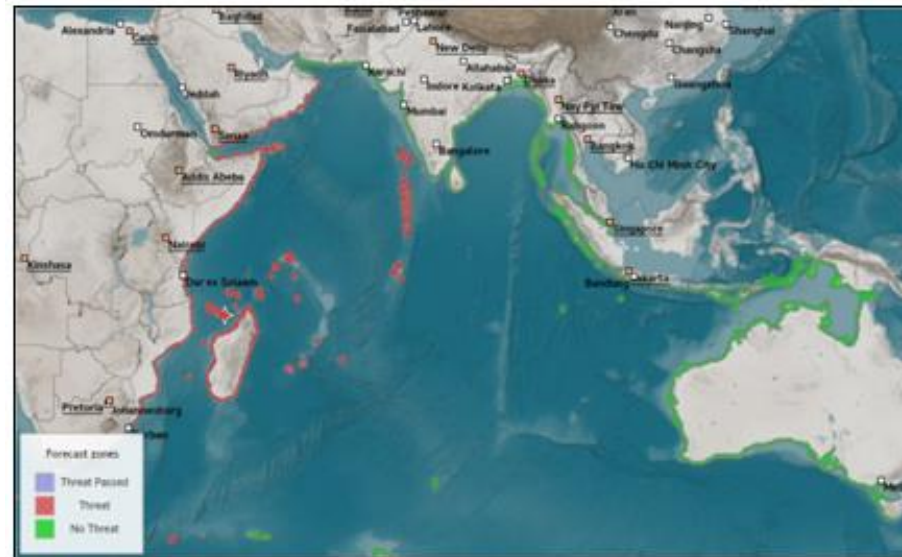


Figure 8. Threat Map example for Scenario 3, Fani Maore Volcano.

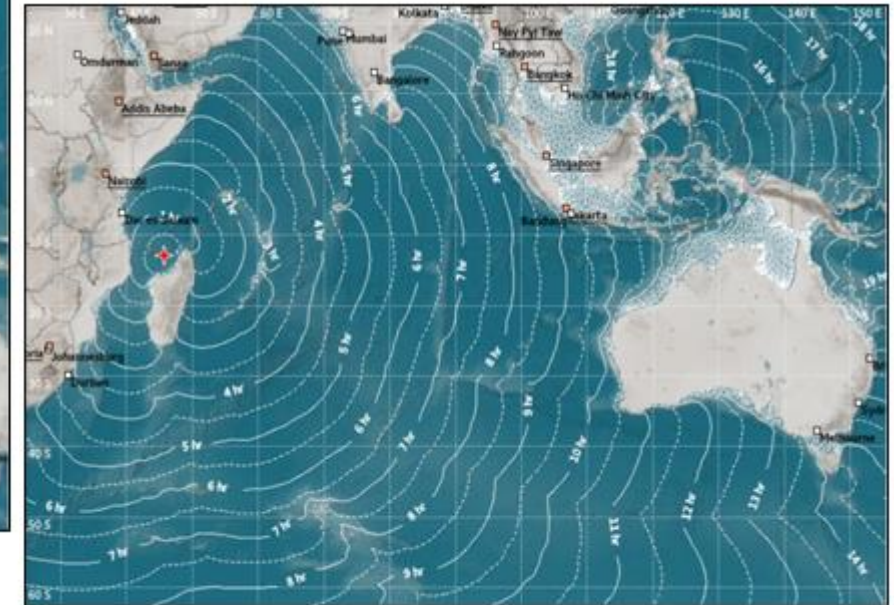


Figure 9. First detectable wave Tsunami Travel Time contour map example for Scenario 3, Fani Maore Volcano.



# Scenario 4

## Sumatra Trench, M9.2, 05 November 2025, 03:00 UTC

| Country              | T2 (UTC) | MAX BEACH (m) |
|----------------------|----------|---------------|
| Australia            | 04:06    | 7.7           |
| Bangladesh           | 05:56    | 3.7           |
| Comoros              | 11:16    | 2.6           |
| Djibouti             | 12:34    | 2.7           |
| France               | 09:00    | 7.2           |
| India                | 03:02    | 29.9          |
| Indonesia            | 03:00    | 43.3          |
| Iran                 | 10:42    | 2.0           |
| Kenya                | 11:08    | 4.6           |
| Madagascar           | 10:24    | 8.8           |
| Malaysia             | 05:58    | 4.0           |
| Maldives             | 06:02    | 17.1          |
| Mauritius            | 08:40    | 10.7          |
| Mozambique           | 11:42    | 3.2           |
| Myanmar              | 04:14    | 6.1           |
| Oman                 | 09:32    | 3.9           |
| Pakistan             | 10:06    | 2.5           |
| Seychelles           | 09:06    | 5.4           |
| Singapore            | -        | -             |
| Somalia              | 10:00    | 6.8           |
| South Africa         | 13:32    | 6.8           |
| Sri Lanka            | 04:36    | 15.6          |
| Tanzania             | 11:28    | 2.8           |
| Thailand             | 04:11    | 11.9          |
| Timor-Leste          | 07:50    | 0.7           |
| United Arab Emirates | 11:36    | 1.2           |
| Yemen                | 09:40    | 6.1           |

Scenario 4 starting at 03:00 UTC on Wednesday 05 November 2025: Magnitude 9.2 earthquake in Northern Sumatra, Indonesia. The simulated tsunami will take approximately 0 hours to travel from its source to Indonesia; 0.5 hours to travel to India; 1.0 hours to travel to Thailand & Myanmar, and 2.0 hours to travel to Sri Lanka.

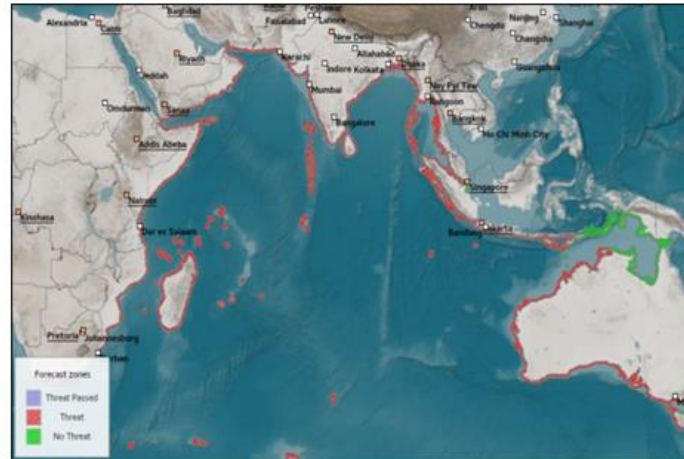


Figure 10. Threat Map example for Scenario 4, Sumatra Trench, for a magnitude ~9.2 earthquake.

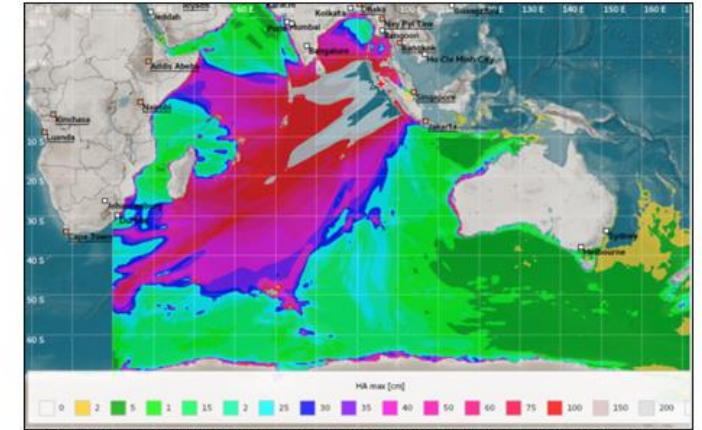


Figure 11. Maximum Wave Amplitude Map example for Scenario 4, Sumatra Trench, for a magnitude ~9.2 earthquake.

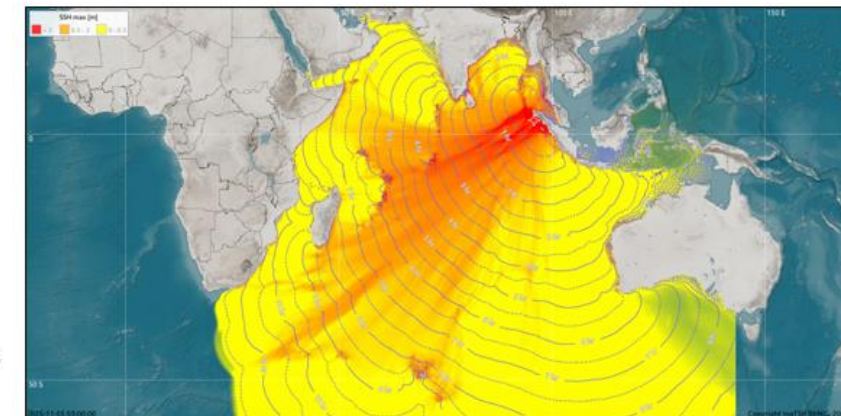


Figure 12. First detectable wave Tsunami Travel Time contour map example for Scenario 4, Sumatra Trench.

# Participation Level

- Member States are invited **to participate in at least one scenario** or all **scenarios** (if country fall under threat);
- Member States are encouraged **to conduct community evacuations**;
- All Member States, particularly those piloting the Programme, are encouraged **to use the UNESCO-IOC Tsunami Ready guidelines and indicators to guide their community preparation for IOWave25 exercise.**

# IOWave25 Check List & Timelines

| No | Activity  | Timeline  |
|----|---|---|
| 1  | Announcement by <a href="#">IOC Circular Letter 3041</a>  | May 2025  |
| 2  | Nominate a National Contact for IOWave25  | June 2025   |
| 3  | Set up IOWave25 Exercise National Coordination Committee involving NTWC, LDMOs, NDMOs, and all other important stakeholders including private industry participants | Ongoing   |
| 4  | Assign agency roles including exercise controller, key participants, and observers  | Ongoing   |
| 5  | Decide on level of participation and identify communities for evacuation (where applicable)   | Ongoing   |
| 6  | Secure funding and support for community activities   | Ongoing   |
| 7  | Address indicators of UNESCO-IOC Tsunami Ready Recognition Programme or similar national initiative (where appropriate)   | Ongoing   |
| 8  | Issue of IOWave25 Exercise Manual by the Secretariat  | June 2025   |
| 9  | Develop a National IOWave25 Exercise Manual to plan/guide activities, including those at community level  | June–July 2025  |
| 10 | UNESCO-IOC Standard Operating Procedure (SOP) Training Workshops (online)   | July–August 2025  |
| 11 | Organise and hold pre-exercise national workshop(s) and meeting(s) with key stakeholders including media  | August–September 2025                                   |
| 12 | Ensure Standard Operating Procedures are in place and up to date  | August–September 2025                                   |
| 13 | Share IOWave25 Exercise in-country participation plans with the ICG/IOTWMS Secretariat  | September 2025  |
| 14 | Prepare a media press release   | One week before the exercise                            |
| 15 | Participate in IOWave25 Exercise  | 25 September<br>15 October<br>25 October<br>05 November |
| 16 | Hold post-exercise hot and cold debriefs  | After the Exercise                                      |
| 17 | Complete the IOWave25 online post-exercise evaluation   | After the Exercise                                      |
| 18 | Revise and improve SOPs in accordance with lessons learnt during the Exercise   | After the Exercise                                      |
| 19 | IOC-UNESCO Post-IOWave25 Exercise Lessons Learnt Workshop (online)  | December 2025   |



# IOWave23 Manual & Supplements

Intergovernmental Oceanographic Commission  
Technical Series

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**EXERCISE INDIAN OCEAN WAVE 25**  
An Indian Ocean-wide Tsunami  
Warning and Communications Exercise

25 September – 05 November 2025

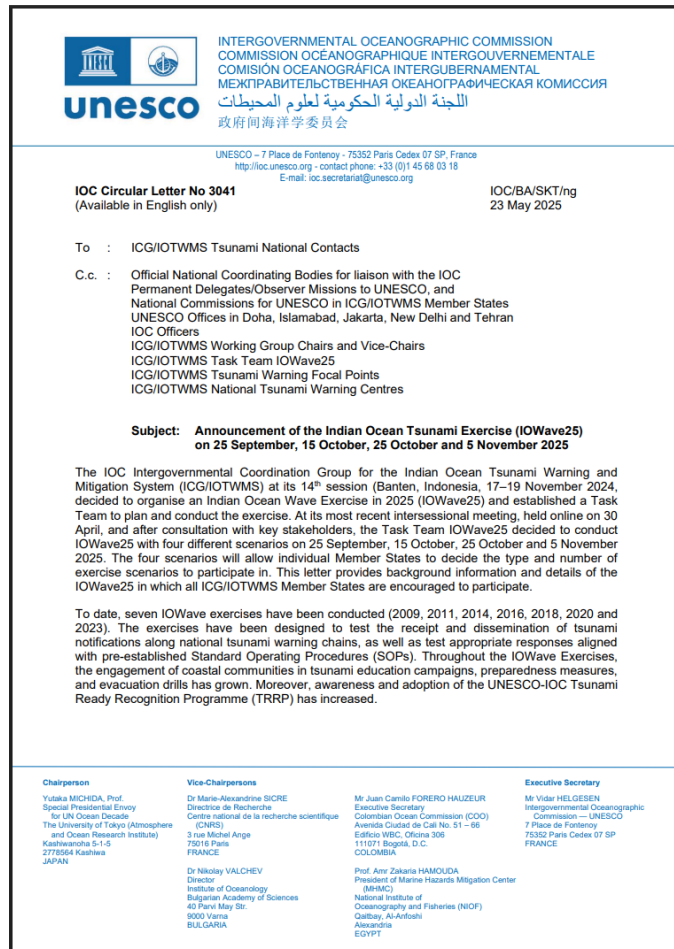
Volume 1      Exercise Manual

UNESCO

- The IOWave25 **Exercise Manual** is complete.
- The **supplements** are under preparation.
- The manual will provide an overview including:  
*Purpose, Objective, Scope, Exercise Success Criteria, Type of Exercise, Scenario, Date, Checklist Activities Member, Exercise Evaluation (Exercise Survey, Exercise Observer), Checklist of Activities for Member States*
- The supplements will contain all TSP bulletins and products.
- The Task Team anticipates **completion** and **circulation by Secretariat in August 2025**.
- All information and documents will **be made available on the exercise website**:

<https://oceanexpert.org/event/4786>

# IOC Circular Letter 3041: Announcement of the Indian Ocean Tsunami Exercise (IOWave25)



IOC Circular Letter No 3041 requests all Tsunami National Contacts to nominate a **National Contact for IOWave25**.

To date nominations have been received from 19 countries:  
*Australia, Bangladesh, France, India, Indonesia, Iran, Kenya, Madagascar, Malaysia, Mauritius, Mozambique, Oman, Pakistan, Seychelles, Singapore, South Africa, Tanzania, Timor Leste and United Arab Emirates*

Please ensure the ICG/IOTWMS Secretariat ([iotwms@unesco.org](mailto:iotwms@unesco.org)) receives your nomination at the earliest.

The IOWave25 National Contact to oversee completion of the post-exercise evaluation online survey.



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**Have a successful exercise!**

**THANK YOU**



**IOWave25**